USER'S MANUAL
Rev. 05/2012

# CD3000 S-2PH
# THYRISTOR UNIT

from 10A to 100A

00003

## Important warning for safety

Thyristor units are used in power industrial equipment.
The voltages used in the Thyristor unit can cause severe electrical shock, and could be lethal.
Don't remove the plastic cover.
Don't use this unit in aerospace and nuclear application.

**Electric Shock Hazard (Risque the choque électrique)**
When thyristor unit has been connected to main supply voltage and is switched off, before to touch it be secure that the unit is isolated and wait at least one minute to allow discharging internal capacitors. Thus be secure that:

- access to thyristor unit is only permitted to specialised personnel;
- the authorised personnel must read this manual before to have access to the unit;
- the access to the unit must be denied to unauthorised personnel.

**Important warnings(attention)**
Local regulations regarding electrical installation should be rigidly observed.

- Safety regulations must be rigidly observed.
- Don't bend components to maintain insulation distances.
- Protect the unit from high temperature humidity and vibrations.
- Don't touch components to prevent electrostatic discharges on them.
- Verify that all rating are in line with real needs.
- If authorized personnel must measure voltage current etc. on units, take away rings and other jewels from fingers and hands.
- Authorized personnel working on thyristor unit under power supply voltage must work on insulated board. Be secure that board is not connected to earth.

This listing does not represent a complete enumeration of all necessary safety cautions.

**Protection(protection)**
CD3000 thyristor unit has a polymeric plastic cover to compliance to International specification IP20. To understand if IP20 protection is sufficient should be evaluated the installation place. Open Type Equipment.

**Earth(terre)**
CD3000 family has isolated heatsink. For safety connect the heatsink to earth to avoid shocks in case that circuit board or thyristor lose insulation. Earth impedance should be correspondent to local earth regulation. Periodically the earth efficiency should be inspected.

**Electromagnetic compatibility (compatibilité électromagnétique)**
Our thyristor units have an excellent immunity to electromagnetic interferences if all suggestions contained in this manual are respected. In respect to a good Engineering practice, all inductive loads like solenoids contactor coils should have a filter in parallel.

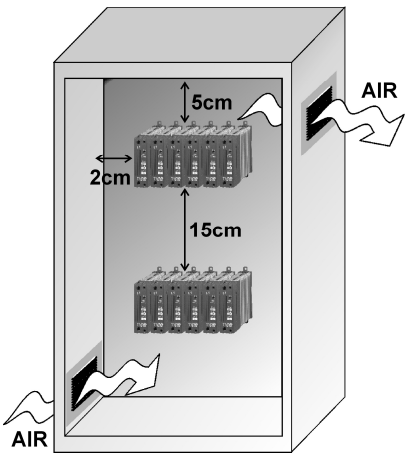
**Emissions (emission)**
All thyristor switching at high speed generate some radiofrequency disturbance. CD3000 series compliance with EMC rules for CE mark. In many installations near electronic devices have not been noted problems. If radiofrequency devices at low frequency are used near the thyristor unit some precautions should be taken like line Filters and shielded cables for input signal and for load cables

**Installation**
Before to install the CD3000 unit examine for damages or deficiencies. If any is found, notify the carrier immediately. Check that the product features shown on CD3000 cover corresponds to that ordered.

Before to switch on the unit be sure that:

- The load current is equal or less than the max current of the thyristor unit.
- The operating voltage is equal or less than the max voltage of the thyristor unit.
- Verify the Fan Power Supply (only for size S6 and S8).

**Mounting**
CD3000 unit should be always mounted in vertical position to improve air cooling on heatsink. Maintain minimum distances in vertical and in horizontal as represented.
Don't install in proximity of hot elements and near units generating electromagnetic interferences.
When more units are mounted in the same cabinet provide air circulation as represented.
Sometimes it is necessary to provide a fan to have better air circulation.



**TECHNICAL SPECIFICATIONS**

| General features | |
|---|---|
| Stocking temperature: | from -40 to +100 °C |
| Operating temperature: | from –30 to +40°C for higher temp. consult derating curve |
| Load isolation: | 2500Veff |
| Cover and Socket material: | PolymericV2 |
| Heatsink: | Anodized aluminium |
| Delay switch ON time: | 0.5 period Max |
| Delay switch OFF time: | 0.5 period Max |
| Fan voltage: (Only for size S8) | 230Vac ±15% (110Vac option.) |

| Input features | |
|---|---|
| Logic input SSR: (Standard for size S0 - S1) | 4 - 30Vdc 20mA Max (ON ≥ 4Vdc OFF < 1Vdc) |
| Logic input SSR: (Standard for other sizes) | 4 - 30Vdc 12mA Max (ON ≥ 4Vdc OFF < 1Vdc) |
| Logic input SSR: (low current) | 5 - 30Vdc 5mA Max (ON ≥ 5Vdc OFF < 1Vdc) |
| 110Vac Input: | 110Vac ±15% 20mA Max |
| 240Vac Input: | 230Vac ±15% 20mA Max |

| Current | Connector Type | Torque Lb-in (N-m) | Wire Range AWG/kcmill | Wire Terminal |
|---|---|---|---|---|
| 10A,15A, 25A,35A | M5 Screw | 26.6 (3.0) | 8 | UL Listed (ZMVV) Wire Pin |
| 45A,75A, 100A | M6 Screw | 70.8 (8.0) | 1 | UL Listed (ZMVV) Fork/Spade Terminal Copper Tube Crimp. Lug |

| Current | Supply | | | Load | | |
|---|---|---|---|---|---|---|
| | Cable | | Screw M | Cable | | Screw M |
| | $mm^2$ | AWG | | $mm^2$ | AWG | |
| 10A (S0) | 4 | 12 | M5 | 4 | 12 | M5 |
| 15A (S1) | 4 | 12 | M5 | 4 | 12 | M5 |
| 25A (S1) | 6 | 10 | M5 | 6 | 10 | M5 |
| 35A (S4) | 10 | 8 | M5 | 10 | 8 | M5 |
| 45A (S7) | 10 | 8 | M6 | 10 | 8 | M6 |
| 75A (S8) | 25 | 4 | M6 | 25 | 4 | M6 |
| 100A (S8) | 35 | 3 | M6 | 35 | 3 | M6 |

| Current | Auxiliary | | | Earth | | |
|---|---|---|---|---|---|---|
| | Cable | | | Cable | | Screw M |
| | $mm^2$ | AWG | | $mm^2$ | AWG | |
| 10A (S0) | 0,50 | 18 | | 4 | 12 | M5 |
| 15A (S1) | 0,50 | 18 | | 4 | 12 | M5 |
| 25A (S1) | 0,50 | 18 | | 6 | 10 | M5 |
| 35A (S4) | 0,50 | 18 | | 6 | 10 | M5 |
| 45A (S7) | 0,50 | 18 | | 6 | 10 | M5 |
| 75A (S8) | 0,50 | 18 | | 6 | 10 | M5 |
| 100A (S8) | 0,50 | 18 | | 6 | 10 | M5 |

| Size | Voltage range | Repetitive peak reverse Voltage | | Latching current | Max peak one cycle | Leakage current | $I^2T$ value thyristor | Frequency range | Power loss | Isolation Voltage |
|---|---|---|---|---|---|---|---|---|---|---|
| (A) | (V) | 480V | 600V | (mAeff) | (10ms) (A) | (mAeff) | tp=10msec | (Hz) | I=Inom (W) | Vac |
| 10A (S0) | 24÷480 | 1200 | 1200 | 150 | 230 | 15 | 610 | 47÷70 | 20 | 2500 |
| 15A (S1) | 24÷480 | 1200 | 1200 | 150 | 230 | 15 | 610 | 47÷70 | 36 | 2500 |
| 25A (S1) | 24÷480 | 1200 | 1200 | 150 | 230 | 15 | 610 | 47÷70 | 60 | 2500 |
| 35A (S4) | 24÷600 | 1200 | 1600 | 250 | 600 | 15 | 1800 | 47÷70 | 88 | 2500 |
| 45A (S7) | 24÷600 | 1200 | 1600 | 450 | 1000 | 15 | 4750 | 47÷70 | 108 | 2500 |
| 75A (S8) | 24÷600 | 1200 | 1600 | 450 | 1350 | 15 | 8830 | 47÷70 | 180 | 2500 |
| 100A (S8) | 24÷600 | 1200 | 1600 | 450 | 2000 | 15 | 19100 | 47÷70 | 240 | 2500 |

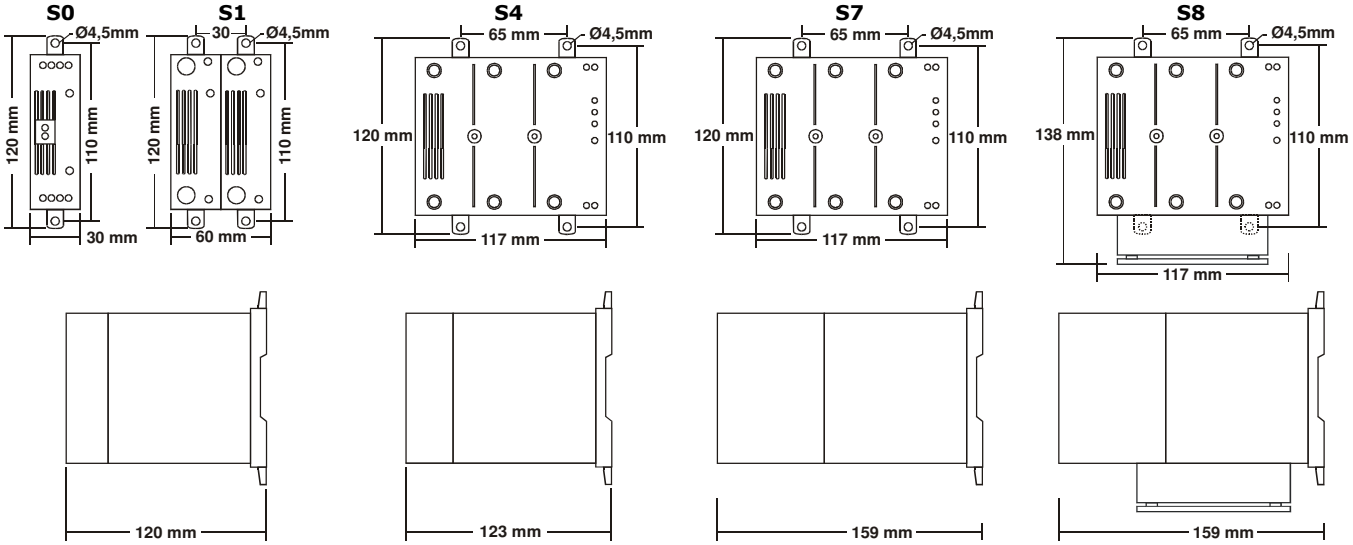
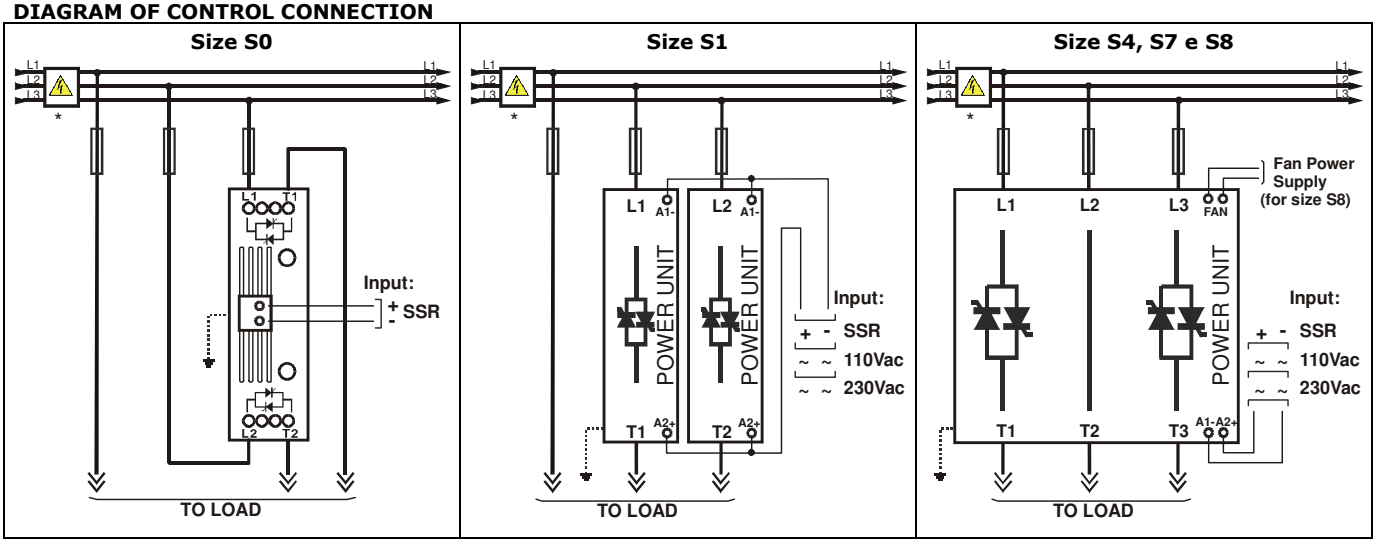
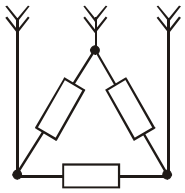


**DIAGRAM OF CONTROL CONNECTION**

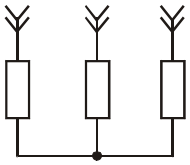



* The user installation must be protecting by electromagnetic circuit breaker or by fuse isolator.

**Load Type**



Delta



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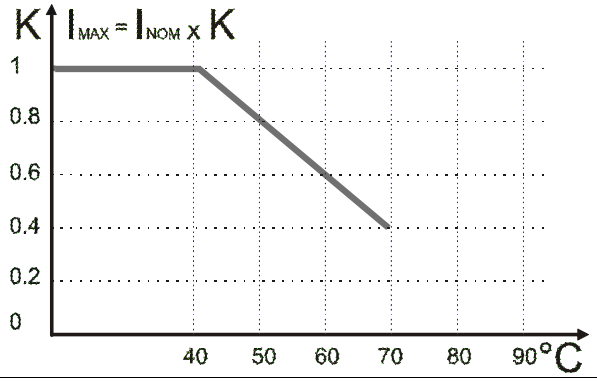
**Wiring instructions**

CD3000S unit has isolated heatsink. For safety connect the heatsink to hearth using its terminal with hearth symbol.
CD3000S can be susceptible to airborne interferences from near equipment or from interferences on main supply, so a number of precautions must be taken.

- Contactors coils and chokes must have in parallel a RC filter and must be supplied with a different voltage line.
- All input/output signals must use screened bifilar wires.
- Signal input and output must not route in same cable try and must not be parallel.
- Local regulations regarding electrical installation should be rigidly observed

Use copper cables and wires rated for use at 75 °C only.
Use wire terminal UL Listed (ZMVV)

**Derating curve**




**Order Code**

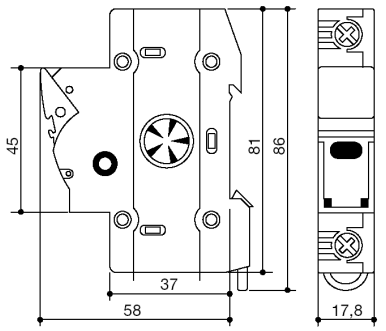
CD3000S-2PH

| Current | Operating Voltage | MAX Volt | Aux | Input | Firing | Options | |
|---|---|---|---|---|---|---|---|
| 10A | Write | 480Vac | NO | SSR | ZC | 110v Fan | Fan at 110Vac |
| 15A | Operating | 600Vac | | 110Vac | | EP | External Protection IP20 for size S7 and S8 |
| 25A | Voltage | | | 230Vac | | EF | External fuses and fuse holders |
| 35A | <= | | | | | NF | No fuses |
| 45A | MAX Volt | | | | | UL | UL Certification |
| 75A | | | | | | | |
| 100A | | | | | | | |

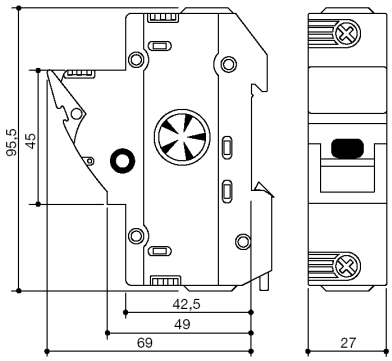
[1] Only for size from 35A to 100A

**FUSES AND FUSE HOLDER**

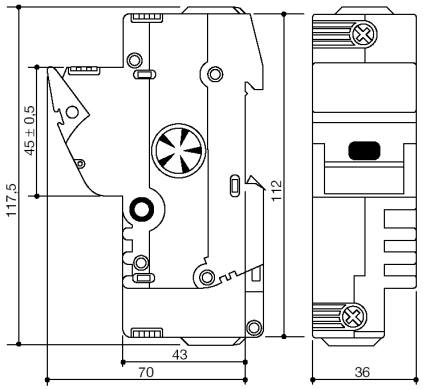
**Size 15A - 25A**



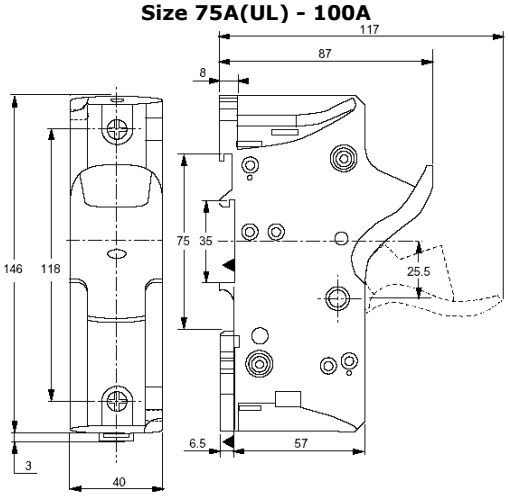

**Size 35A**




**Size 45A - 75A(CE)**




**Size 75A(UL) - 100A**




**WARNING**
CD3000S unit must be protected against short circuit by High speed fuses.
The fuses must be with proper I²t lower than the thyristor one.
The warranty of thyristor is null if no proper fuses are used.

*High speed fuses are only used for the thyristor protection and can not be used to protect the installation*

**WARRANTY CONDITION**
Producer gives a 12 months warranty to its products. The warranty is limited to repairing and parts substitution in our factory and does exclude products not properly used and fuses. Warranty does not include products with serial numbers deleted. The faulty product should be shipped to Producer at customer's cost and our Service will evaluate if product is under warranty terms.
Substituted parts remain of Producer property.

**Fuses and Fuse Code for UL**

| Size | Bussmann Div Cooper (UK) Ltd (200 kARMS Symmetrical A.I.C.) | | | | Ferraz Shawmut SA (200 kARMS Symmetrical A.I.C.) | | | | Qty |
|---|---|---|---|---|---|---|---|---|---|
| | Fuse CODE | Current (ARMS) | I²T (A²sec) | Vac | Fuse CODE | Current (ARMS) | I²T (A²sec) | Vac | |
| 10A | FWC 16A10F | 16 | 150 | 600 | 660 Grb 10-16 | 16 | 145 | 660 | 3 |
| 15A | FWC 16A10F | 16 | 150 | 600 | 660 Grb 10-16 | 16 | 145 | 660 | 3 |
| 25A | FWC 32A10F | 32 | 600 | 600 | 660 Grb 10-32 | 32 | 740 | 660 | 3 |
| 35A | FWP 40A14F | 40 | 750 | 700 | CP URC 14x51/40 | 40 | 700 | 660 | 3 |
| 45A | FWP 63A22F | 63 | 3080 | 700 | CP URD 22x58/63 | 63 | 1850 | 660 | 3 |
| 75A | - | - | - | - | CP URQ 27x60/100 | 100 | 3210 | 660 | 3 |
| 100A | - | - | - | - | CP URQ 27x60/160 | 160 | 15000 | 660 | 3 |

**Fuses and Fuse Code for CE**

| Size | Fuse and Fuse holder CODE | Fuse CODE | Current (ARMS) | I²T (max) (A² sec.) |
|---|---|---|---|---|
| 10A | FFH1038/16A | FU1038/16A | 16 | 150 |
| 15A | FFH1038/16A | FU1038/16A | 16 | 150 |
| 25A | FFH1038/32A | FU1038/32A | 32 | 600 |
| 35A | FFH1451/40A | FU1451/40A | 40 | 1650 |
| 45A | FFH2258/50A | FU2258/50A | 50 | 2000 |
| 75A | FFH2258/100A | FU2258/100A | 100 | 13500 |
| 100A | FFH2258/125A | FU2258/125A | 125 | 14000 |